

CLAIMS

What is claimed is:

1. A method of recording data on a recording medium, the method comprising:
selecting a defect management mode selectable between a defect management on mode and a defect management off mode so that the selected mode indicates whether defect management is to be performed on the recording medium;
recording the data on the recording medium while defect management is performed on the recording medium, if the defect management on-mode is selected; and
recording the data on the recording medium without defect management, if the defect management off mode is selected.
2. The method of claim 1, wherein recording of the data in the defect management on mode comprises initializing the recording medium to the defect management on mode, wherein the initialization comprises:
assigning a spare area to a data area of the recording medium for replacing a defect generated in the data area of the recording medium; and
recording temporary defect management information including information on the assigned spare area and an identifier indicating the defect management on mode, in a temporary defect management area of the recording medium.
3. The method of claim 2, wherein the recording of the data in the defect management on mode further comprises:
recording a replacement block, which replaces a defect block concerning the defect generated in the data area, in the spare area in predetermined operation units; and
updating the information on the defect and the defect management information for defect management as the temporary defect management information in the temporary defect management area in predetermined operation units.
4. The method of claim 3, wherein the recording of the data in the defect management on mode further comprises:

changing a size of the spare area; and

updating the temporary defect management information to include information on the changed size of the spare area and recording the updated temporary defect management information in the temporary defect management area.

5. The method of claim 3, wherein the recording of the data in the defect management on mode further comprises converting the defect management on mode into the defect management off mode.

6. The method of claim 5, wherein the conversion into the defect management off mode comprises:

reinitializing the recording medium to be in the defect management off mode; and
recording the data on the recording medium without defect management after the recording medium is reinitialized in the defect management off mode.

7. The method of claim 6, wherein the reinitialization to the defect management off mode comprises:

recording an identifier indicating the defect management off mode in the temporary defect management area; and
recording the temporary defect management information that was finally updated in the temporary defect management area in a defect management area of the recording medium.

8. The method of claim 3, further comprising finalizing the recording medium.

9. The method of claim 8, wherein the finalization of the recording medium comprises:

recording a finalization flag indicating the finalization of the recording medium in the temporary defect management area;

recording temporary defect management information including recording finally updated information on the defect and defect management information of the temporary defect management area in a defect management area of the recording medium; and

filling with predetermined data a remaining area of the temporary defect management area where no data is recorded.

10. The method of claim 1, wherein recording of the data in the defect management off mode comprises:

recording the data in a data area of the recording medium in predetermined operation units; and

updating recording management information according to the recording of the data in a temporary defect management area of the recording medium.

11. The method of claim 10, further comprising finalizing the recording medium.

12. The method of claim 11, wherein the finalization of the recording medium comprises:

recording a finalization flag, which indicates the recording medium is finalized, in the temporary defect management area;

recording recording management information that is finally updated in the temporary defect management area in a defect management area of the recording medium; and

filling with predetermined data a remaining area of the temporary defect management area where no data is recorded.

13. A method of reproducing data recorded on a recording medium having a lead-in area, a data area, and a lead-out area consecutively arranged, the method comprising:

reading defect management on/off mode information, which indicate whether defect management is performed on the recording medium, from a temporary defect management area in the lead-in area or the lead-out area, and which is used to update information on a defect generated in the data area and defect management information for management of the defect for every predetermined operations; and

reading data recorded in the data area based on the read defect management on/off mode information.

14. The method of claim 13, further comprising reading finally updated information on the defect and finally updated defect management information from the temporary defect management area, if the read defect management on/off mode information is a defect management on mode.

15. The method of claim 14, further comprising:
reading a finalization flag, which indicates the recording medium is finalized, from the temporary defect management area; and
reading the finally updated information on the defect and the finally updated defect management information from a defect management area of the recording medium.

16. The method of claim 13, further comprising reading final recording management information from the temporary defect management area, if the read defect management on/off mode information is a defect management off mode.

17. The method of claim 16, further comprising:
reading the finalization flag, which indicates the recording medium is finalized, from the temporary defect management area; and
reading the finally updated information on the defect and the finally updated defect management information from a defect management area of the recording medium.

18. An apparatus for recording and/or reproducing data with respect to a recording medium, the apparatus comprising:
a recording/reading unit, which transfers the data with respect to the recording medium;
and
a control unit, which selects a defect management mode selectable between a defect management on mode and a defect management off mode so that the selected defect management mode indicates whether defect management is to be performed while data is recorded in the recording medium, controls the recording/reading unit to record the data in the recording medium while defect management is performed on the recording medium, if the defect management on mode is selected, and controls the recording/reading unit to record the

data in the recording medium without defect management, if the defect management off mode is selected.

19. The apparatus of claim 18, wherein the control unit initializes the recording medium to the defect management on mode when the defect management on mode is selected, and during the initialization, the control unit assigns a spare area for replacing a defect generated in a data area of the recording medium to the data area and controls the recording/reading unit to record information on the assigned spare area and temporary defect management information, which includes an identifier indicating the defect management on mode, in a temporary defect management area of the recording medium.

20. The apparatus of claim 19, wherein the control unit further controls the recording/reading unit to record a replacement block, which replaces a defect block having the defect generated in the data area, in the spare area in each of predetermined operation units, and to update the information on the defect and the defect management information for defect management as the temporary defect management information in the temporary defect management area in the predetermined operation units.

21. The apparatus of claim 20, wherein the control unit further changes a size of the spare area and controls the recording/reading unit to update the temporary defect management information to include information on the changed size of the spare area and to record the updated temporary defect management information in the temporary defect management area.

22. The apparatus of claim 20, wherein the control unit further converts the defect management on mode into the defect management off mode.

23. The apparatus of claim 22, wherein the control unit reinitializes the recording medium to the defect management off mode and controls the recording/reading unit to record the data in the recording medium without defect management after the conversion to the defect management off mode.

24. The apparatus of claim 23, wherein the control unit further controls the recording/reading unit to record an identifier indicating the defect management off mode in the temporary defect management area and to record temporary defect management information that was finally updated in the temporary defect management area in a defect management area of the recording medium.

25. The apparatus of claim 20, wherein the control unit controls the recording/reading unit to record a finalization flag indicating a finalization of the recording medium in the temporary defect management area, to record the temporary defect management information including the finally updated information on the defect and defect management information of the temporary defect management area in a disc management area of the recording medium, and to fill with predetermined data a remaining area of the temporary defect management area where no data was recorded.

26. The apparatus of claim 18, wherein:
the control unit controls the recording/reading unit to record the data in a data area of the recording medium in predetermined operation units, and to update recording management information according to the recording of the data in a temporary defect management area of the recording medium when the defect management off mode is selected, and
the recording management information does not include defect management information.

27. The apparatus of claim 26, wherein the control unit controls the recording/reading unit to:
record a finalization flag, which indicates the recording medium is finalized, in the temporary defect management area,
record recording management information finally updated in the temporary defect management area in a disc management area provided in the recording medium, and
fill with predetermined data in a remaining area of the temporary defect management area where no data was recorded.

28. An apparatus for recording and/or reproducing data recorded on a recording medium where a lead-in area, a data area, and a lead-out area are consecutively arranged, the apparatus comprising:

a reading unit, which transfers data with respect to the recording medium; and

a control unit, which controls the reading unit to read defect management on/off mode information, where the mode selectively indicates one of whether defect management has been performed on the recording medium and whether defect management has not been performed, from a temporary defect management area provided in the lead-in area or the lead-out area so as to update information on a defect generated in the data area and defect management information used for management of a defect for each of a plurality of predetermined operations, and controls the reading unit to read data recorded in the data area based on the read defect management on/off mode information.

29. The apparatus of claim 28, wherein the control unit further controls the reading unit to read finally updated information on the defect and finally updated defect management information from the temporary defect management area, if the read defect management on/off mode information is a defect management on mode.

30. The apparatus of claim 29, wherein the control unit controls the reading unit to read a finalization flag, which indicates the recording medium was finalized, from the temporary defect management area, and to read the finally updated information on the defect and the finally updated defect management information from a defect management area of the recording medium.

31. The apparatus of claim 28, wherein the control unit controls the reading unit to read final recording management information from the temporary defect management area, if the read defect management on/off mode information is a defect management off mode.

32. The apparatus of claim 31, wherein the control unit controls the reading unit to read a finalization flag, which indicates the recording medium was finalized, from the temporary defect management area, and to read the finally updated information on the defect and the finally updated defect management information from a defect management area of the recording medium.

33. An optical recording medium for use with a recording and/or reproducing apparatus, comprising:

a lead-in area, a data area, and a lead-out area consecutively arranged in the optical recording medium;

a temporary defect management area for recording temporary information on a defect generated in the data area and temporary defect management information for management of the defect, the temporary defect management area being in the lead in area or lead out area; and

a defect management area for recording final information on the defect and final defect management information and which is in

the lead-in area or the lead-out area,

wherein the temporary defect management information in the temporary defect management area includes defect management on/off mode information that indicates to the apparatus one of whether data is to be recorded on the recording medium while defect management is performed on the recording medium and whether data is to be recorded without defect management.

34. The optical recording medium of claim 33, wherein, if the defect management on/off mode information indicates to the apparatus that the recording medium is initialized to a defect management on mode:

the medium further comprises a spare area for recording a replacement block that replaces a defect block concerning a defect generated by the apparatus in the data area of the recording medium in predetermined operation units is assigned by the apparatus to the data area,

the defect management area is empty, and

the temporary defect management area enters a state where the information on the defect and the defect management information for management of the defect is updated by the apparatus in predetermined operation units.

35. The optical recording medium of claim 34, wherein, if a size of the spare area of the recording medium is changed by the apparatus and the recording medium is reinitialized, information on a changed size of the spare area is recorded by the apparatus in the temporary defect management area.

36. The optical recording medium of claim 34, wherein, if the defect management on/off mode information indicates to the apparatus that the recording medium is reinitialized to a defect management off mode, information indicating the defect management off mode is recorded by the apparatus in the temporary defect management area and the temporary defect management information that was finally updated in the temporary defect management area is recorded by the apparatus in the defect management area.

37. The optical recording medium of claim 34, wherein, when the recording medium is finalized, a finalization flag, which indicates the recording medium is finalized, is recorded in the temporary defect management area, temporary defect management information finally recorded in the temporary defect management area is recorded in the defect management area, and predetermined data fills in a remaining area of the temporary defect management area where no data was recorded.

38. The optical recording medium of claim 33, wherein, if the defect management on/off mode information indicates to the apparatus that the recording medium is initialized to the defect management off mode, the defect management area is empty and the temporary defect management area enters a state where recording management information according to the recording of the data in the data area is updated by the apparatus in predetermined operation units.

39. A computer readable recording medium encoded with processing instructions for implementing a method of recording data on a recording medium performed by a computer, the method comprising:

selecting a defect management mode as one of a defect management on mode and a defect management off mode so as to indicate whether defect management is to be performed on the recording medium;

recording the data in the recording medium while defect management is performed on the recording medium, if the defect management on mode is selected; and

recording the data in the recording medium without defect management, if the defect management off mode is selected.

40. A computer readable recording medium encoded with processing instructions for implementing a method of reproducing data recorded on a recording medium having a lead-in area, a data area, and a lead-out area consecutively arranged as performed by a computer, the method comprising:

reading defect management on/off mode information, where the mode indicates whether defect management has been performed on the recording medium and whether defect management was not performed, from a temporary defect management area provided in the lead-in area or the lead-out area, so as to update information on a defect generated in the data area and defect management information for management of the defect for every predetermined operations; and

reading data recorded in the data area based on the read defect management on/off mode information.

41. A method of recording data on a recording medium, the method comprising:

detecting information for a defect management mode selectable between a defect management on mode, in which defect management is performed to manage defects on the recording medium, and a defect management off mode, in which defect management is not performed to manage defects on the recording medium; and

transferring the data with respect to the recording medium according to the selected defect management mode.

42. The method of claim 41, wherein the detecting the information comprises receiving information through an input device to determine the selected defect management mode.

43. The method of claim 41, wherein the detecting the information comprises receiving information from an apparatus which is to perform the transfer to determine the selected defect management mode.

44. The method of claim 41, wherein the transferring the data comprises recording the data, and the method further comprises, if the detected information is the defect management on mode, recording the data using the defect management to manage the defects occurring during the recording the data.

45. The method of claim 41, wherein the transferring the data comprises recording the data, and the method further comprises, if the detected information is the defect management off mode, recording the data without the defect management to manage the defects occurring during the recording the data.

46. The method of claim 41, wherein:
the transferring the data comprises recording the data according to the selected defect management mode,
the selected defect management mode is one of the defect management on mode and the defect management off mode, and
the method further comprises, after the recording the data,
detecting another defect management mode which selects the other one of the defect management on mode and the defect management off mode, and
transferring additional data according to the detected another defect management mode.

47. The method of claim 46, wherein:

the recording medium includes a temporary defect management area in which the temporary defect information and temporary defect management information for managing the defects prior to finalization of the recording medium, and a final defect management area which includes the temporary defect information and the temporary defect management information recorded during finalization of the recording medium, and

the method further comprises, after the recording the data and if the detected another defect management mode is the defect management off mode,

recording the temporary defect information and the temporary defect management information for the recorded data in the final defect management area prior to finalization of the recording medium, and

recording fill data in areas of the final defect management area other than the area in which the temporary defect information and the temporary defect management information are recorded.

48. An apparatus for recording and/or reproducing data with respect to a recording medium, the apparatus comprising:

a transfer unit that transfers the data with respect to the recording medium; and
a control unit that detects a defect management mode selectable between a defect management on mode, in which defect management is performed to manage defects on the recording medium, and a defect management off mode, in which defect management is not performed to manage defects on the recording medium, and controls the data transfer unit to transfer the data according to the selected defect management mode.

49. The apparatus of claim 48, further comprising an input unit through which the control unit receives information to detect the selected defect management mode.

50. The apparatus of claim 48, wherein, in order to detect the information to determine the selected defect management mode, the control unit retrieves predetermine information stored in the apparatus and which indicates the defect management mode to be selected.

51. The apparatus of claim 48, wherein the control unit controls the transfer unit to, if the defect management mode is the defect management on mode, record the data using the defect management to manage the defects occurring during the recording the data.

52. The apparatus of claim 48, wherein the control unit controls the transfer unit to, if the detected defect management mode is the defect management off mode, record the data without the defect management to manage the defects occurring during the recording the data.

53. The apparatus of claim 48, wherein:
the control unit controls the transfer unit to record the data according to the detected defect management mode, where the detected defect management mode is one of the defect management on mode and the defect management off mode,
the control unit detects another defect management mode which selects the other one of the defect management on mode and the defect management off mode, and
the control unit controls the transfer unit to transfer additional data according to the detected another defect management mode.

54. The apparatus of claim 53, wherein:
the recording medium includes a temporary defect management area in which the temporary defect information and temporary defect management information for managing the defects prior to finalization of the recording medium, and a final defect management area which includes the temporary defect information and the temporary defect management information recorded during finalization of the recording medium, and
the control unit further, after the recording the data and if the detected another defect management mode is the defect management off mode, controls the transfer unit to record the temporary defect information and the temporary defect management information for the recorded data in the final defect management area prior to finalization of the recording medium, and record fill data in areas of the final defect management area other than the area in which the temporary defect information and the temporary defect management information are recorded.

55. A recording medium for use with a recording and/or reproducing apparatus.
comprising:

a data area with respect to which data is to be recorded on the recording medium, and
a defect management area including defect mode information selectable between a
defect management on mode, in which defect management is performed to manage defects on
the recording medium, and a defect management off mode, in which defect management is not
performed to manage defects on the recording medium,

wherein the apparatus transfers the data to the data area according to the one of the
defect management on and off modes selected in the defect mode information.

56. The recording medium of claim 55, wherein:

the defect management area further comprises:

a temporary defect management area for recording temporary defect information
on defects generated in the data area and temporary defect management information for
management of the defects; and

a final defect management area for recording final defect information on the
defect and final temporary defect management information, and

the temporary defect management information recorded in the temporary defect
management area includes the defect mode information.

57. The recording medium of claim 56, wherein:

the temporary defect management area further comprises finalization information which
indicates whether the recording medium has been finalized, and

if the finalization information indicates to the apparatus that the recording medium has
not been finalized and the defect mode information indicates to the apparatus the selection of
the defect management off mode, the final defect management area is filled in to prevent the
apparatus from writing the final defect information and the final management information in the
final defect management area.

58. The recording medium of claim 56, wherein, if the finalization information indicates to the apparatus that the recording medium has not been finalized and the defect mode information indicates to the apparatus the selection to the defect management off mode, the final defect management area includes a last recorded temporary defect information and a last recorded temporary defect management information which was recorded in the temporary defect management area prior to the selection of the defect management off mode.

59. The recording medium of claim 56, wherein, if the finalization information indicates to the apparatus that the recording medium has not been finalized and the defect mode information indicates to the apparatus the selection to the defect management off mode, the final defect management area includes no temporary defect information and no temporary defect management information.